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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,399	01/21/2005	Michael Koccher	5100.P0100US	6316
23474	7590	06/14/2007	EXAMINER	
FLYNN THIEL BOUTELL & TANIS, P.C.			TALBOT, MICHAEL	
2026 RAMBLING ROAD			ART UNIT	PAPER NUMBER
KALAMAZOO, MI 49008-1631			3722	
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06/14/2007		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/522,399	KOECHER, MICHAEL
	Examiner	Art Unit
	Michael W. Talbot	3722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 19 March 2007.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-18 and 36-47 is/are pending in the application.  
 4a) Of the above claim(s) 36-47 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-18 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 21 January 2005 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_

**DETAILED ACTION**

1. Newly submitted claims 36-47 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Claims 36-47 are drawn to a cutting tool having a tool shank and a cutting head made of different materials integrally connected to one another via a brazing disk. The brazing disk comprising a ductile brazing material containing embedded powder particles made of temperature-resistant material having a lower coefficient of thermal expansion than the brazing material and wherein the coefficient of thermal expansion over the joining layer thickness is lower on the cutting head side than on the tool shank side. The brazing disk having a density of the powder particles varying over the disk radius and including holes, recesses or grooves. The brazing disk further comprising first and second brazing disks.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 36-47 are withdrawn from consideration as being directed to a non-elected invention (see Applicant's response dated 27 June 2006 to the Election/Restriction Office Action dated 26 April 2006 wherein Applicant withdrew all claims directed to "at least two brazing disks" described in Group II and "a brazing disk" described in Group III). See 37 CFR 1.142(b) and MPEP § 821.03.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4, 9, 15, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foerster '613 in view of Cadden et al. '914. Foerster '613 discloses a cutting tool having a tool shank and a cutting head (col. 1, lines 25-27) made of different materials (col. 1, lines 42-46 and col. 2, lines 3-12) which are integrally connected to one another via a joining layer made of a ductile brazing material (col. 1, line 70 through col. 2, line 2) at joining surfaces and powder

particles (col. 1, line 70 through col. 2, line 2) made of temperature resistant material having a lower coefficient of thermal expansion than the brazing material being embedded into the joining layer. Foerster '613 further discloses the tool shank being made of steel, (col. 2, lines 3-12 and lines 66-71) the cutting head being made of carbide (col. 1, lines 42-46) and, the joining layer being made of copper-manganese-nickel with a thickness of 1/32 inch (0.794 mm) and the powder particles being made of nickel (col. 1, line 70 through col. 2, line 2). Foerster '613 lacks the joining layer having a different coefficient of thermal expansion over its layer thickness such that the coefficient of thermal expansion is lower on the side of the cutting head than on the side of the tool shank.

Cadden et al. '914 shows in Figures 1 and 2 a joining layer (12,13,14) having a different coefficient of thermal expansion over its layer thickness (due to the differing material composition of layers 12,13 and 14 described in col. 3, lines 60 through col. 4, line 12) such that the coefficient of thermal expansion is lower on the side of the cutting head than on the side of the tool shank (due to the joining layer consisting of a composite matrix using powdered tungsten powder dispersed throughout a copper matrix exhibiting closely matching coefficient of thermal expansion at the respective joining layer/adjoining material composition interfaces described in col. 2, line 43 through col. 3, line 16. In order to achieve this, the tungsten powder particles are more closely concentrated, i.e. greater density, at the joining layer interface matching the like-composition material of the cutting head). In view of this teaching of Cadden et al. '914, it would have been obvious to one of ordinary skill in the art to modify the joining layer of Foerster '613 to include a differing coefficient of thermal expansion over its layer thickness being lower on the side of the cutting head than on the side of the tool shank for the purpose of reducing the thermal stresses at the specific material interfaces, thus improving the

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adjoining connection, by best matching the coefficient of thermal expansion of the layer thickness interface with that of the respective adjoining material compositions.

4. Claims 4-6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foerster '613 in view of Cadden et al. '914, further in view of Guhring '055. Foerster '613 in view of Cadden et al. '914 further discloses a tool shank made of 0.6 to 0.9 percent chromium (chrome being "a part of" the element chromium). Foerster '613 in view of Cadden et al. '914 lacks the tool shank being made from tool steel or a case-hardening steel carburized or nitrided at least on the outer surface.

Guhring '055 shows in Figures 1-1a a cutting tool (1) having a tool shank (2,3) made from tool steel or case-hardening nitriding steel (col. 5, lines 25-29) to form an outer skin hardness. In view of this teaching of Guhring '055, it would have been obvious to one of ordinary skill in the art to manufacturing the tool shank of Foerster '613 in view of Cadden et al. '914 from either a tool steel or a case-hardening nitriding steel as taught by Guhring '055 to provide sufficient elasticity, skin hardness and toughness.

5. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foerster '613 in view of Cadden et al. '914, further in view of Guhring '055. Foerster '613 in view of Cadden et al. '914 lacks the tool shank having at least one helically wound flute and at least one helically wound functionally passage which passes through the joining layer in the direction of the cutting head.

Guhring '055 shows in Figures 1-1a a cutting tool (1) having at least one helically wound flute (21,61) and at least one helically wound functionally passage (4,7) which passes through the joining layer in the direction of the cutting head. In view of this teaching of Guhring '055, it would have been obvious to one of ordinary skill in the art to manufacturing the tool shank of Foerster '613 in view of Cadden et al. '914 to include at least one helically wound flute and at

least one helically wound functionally passage as taught by Guhring '055 to provide for chip evacuation and a means for coolant delivery to the cutting tip, thus reducing heat generation and tip wear.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Foerster '613 in view of Cadden et al. '914, further in view of Guhring '055. Foerster '613 in view of Cadden et al. '914, further in view of Guhring '055 discloses the claimed invention except for the tool steel being made of 16MnCr5 steel. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to select 16MnCr5 steel for the purpose of its well-known distinct mechanical properties, because it has been held to be within the general skill of a worker in the art to select a known material composition on the basis of its suitability for the intended use as a matter of obvious design choice.

7. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foerster '613 in view of Cadden et al. '914, further in view of Nagel 2002/0009340. Foerster '613 in view of Cadden et al. '914 lacks the joining surface of the cutting head being convexly curved and facing the joining surface of the tool shank which is concavely curved so as to be complementary to one another.

Nagel 2002/0009340 shows in Figures 2-6 a cutting tool (11) having a joining surface of the cutting head (12) being convexly curved (15) and facing the joining surface of the tool shank (13) which is concavely curved (14) so as to be complementary to one another (page 2 through 2, paragraph [0032]). In view of this teaching of Nagel 2002/0009340, it would have been obvious to one of ordinary skill in the art to manufacturing the tool shank and cutting head of Foerster '613 in view of Cadden et al. '914 to include complementary curved joining surfaces as taught by Nagel 2002/0009340 to provide for an increased brazing contact surface area, thus improving the connection weld between the two adjoining pieces.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Foerster '613 in view of Cadden et al. '914. Foerster '613 in view of Cadden et al. '914 discloses the claimed invention except for the thickness of the joining layer corresponding to 10 to 1000 times the diameter of the powder particles. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to select the joining layer corresponding to 10 to 1000 times the diameter of the powder particles for the purpose of reducing the thermal stresses at the specific material interfaces, thus improving the adjoining connection, because it has been held to be within the general skill of a worker in the art to select a known material composition on the basis of its suitability for the intended use as a matter of obvious design choice (col. 2, line 61 through col. 3, line 7).

***Response to Arguments***

9. Applicant's arguments, see pages 9-18, filed 19 March 2007, with respect to the rejection(s) of claim(s) 1-8 under 35 USC 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly cited reference Cadden et al. '914.

***Conclusion***

10. Any inquiry concerning the content of this communication from the examiner should be directed to Michael W. Talbot, whose telephone number is 571-272-4481. The examiner's office hours are typically 8:30am until 5:00pm, Monday through Friday. The examiner's supervisor, Mrs. Monica S. Carter, may be reached at 571-272-4475.

In order to reduce pendency and avoid potential delays, group 3720 is encouraging FAXing of responses to Office Actions directly into the Group at FAX number 571-273-8300. This practice may be used for filling papers not requiring a fee. It may also be used for filing

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papers, which require a fee, by applicants who authorize charges to a USPTO deposit account.

Please identify Examiner Michael W. Talbot of Art Unit 3722 at the top of your cover sheet.

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MWT

Examiner  
8 June 2007



MONICA CARTER  
SUPERVISORY PATENT EXAMINER